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CLAIMS

~~1. A substrate used for opto-electric or electrical~~ devices which comprises a layer of nitride grown by means of vapor phase epitaxy growth wherein both main surfaces of the nitride substrate are substantially consisting of non N-polar face and N-polar face respectively and the dislocation density of the substrate is $5\times10^5/cm^2$ or less, wherein the substrate has a thickness of 100 μm or more preferably 150 μm or more which is sliced from a portion of the layer B1 and/or B2) in the combination layers of A) the layer of bulk mono-crystal nitride containing at least one element of alkali metals (Group I, IUPAC 1989), B1) the layer of nitride grown by means of MOCVD or MBE and/or B2) the layer of gallium-containing nitride grown by means of HVPE.

2. A substrate used for opto-electric or electrical devices which comprises a layer of nitride grown by means of vapor phase epitaxy growth wherein both main surfaces of the nitride substrate are substantially consisting of non N-polar face and N-polar face respectively and the dislocation density of the substrate is $5\times10^5/cm^2$ or less, wherein the substrate has a thickness of 100 μm or more, preferably 150 μm or more which is sliced from a portion of the layer C1) and/or C2) in the combination layers of A1) the layer of bulk mono-crystal nitride containing at least

one element of alkali metals (Group I, IUPAC 1989), B) the ~~layer of nitride grown by vapor phase epitaxy growth, A2)~~ the layer of bulk mono-crystal nitride containing at least one element of alkali metals (Group I, IUPAC 1989), C1) the layer grown by means of MOCVD or MBE and/or C2) the layer of gallium-containing nitride grown by means of HVPE.

3. A process of preparing a substrate for opto-electric or electrical devices which comprises steps of:

(a) preparing a layer A) of bulk mono-crystal nitride containing at least one element of alkali metals (Group I, IUPAC 1989) to have a thickness for substrate by crystallization of gallium or aluminum-containing nitride on a seed from a super-critical ammonia-containing solution; (b) forming a layer B) or C) of nitride by means of vapor phase epitaxy growth on Al or Ga-polar face of the layer A);

and (c) slicing the layer B) or C) off from the substrate A) to get a substrate having a thickness of 100 μm or more and a main surface substantially consisting of Al or Ga-polar face.

4. A process of preparing a substrate for opto-electric or electrical devices, wherein the step (b) comprises (b1) forming a layer B1) or C1) of nitride by means of vapor phase epitaxy growth on Al or Ga-polar face of the layer A) and (b2) forming a layer B2) or C2) of nitride by means of

vapor phase epitaxy growth on the layer B1) or C1);

~~and (c) slicing the layer B2) or C2) off from the substrate~~

A) to get a substrate having a thickness of 100 μm or more and a main surface substantially consisting of Al or Ga-polar face.

5. A process of preparing a substrate for opto-electric or electrical devices, which further comprises (d) forming a layer D) of nitride by means of vapor phase epitaxy growth on Al or Ga-polar face of the layer B), C), B2) or C2).

6. A process of preparing a substrate for opto-electric or electrical devices, which further comprises (d) forming a layer D) of nitride by means of vapor phase epitaxy growth on Al or Ga-polar face of the layer B), C), B2) or C2);

and (e) slicing the layer D) off from the substrate B), C), B2) or C2) to get a substrate having a thickness of 100 μm or more and a main surface substantially consisting of Al or Ga-polar face.

7. A process of preparing a substrate for opto-electric or electrical devices, according to any one of claims 3 to 6, wherein the layer B), B1), C) or C1) is prepared by MOCVD and has a thickness of 0.1 to 3 μm.

8. A process of preparing a substrate for opto-electric or electrical devices according to claim 7, which comprises

further step of polishing one of the faces of the layer B), B2), C) or C2) to get a substrate for vapor phase epitaxy.

9. A process of preparing a substrate for opto-electric or electrical devices according to any one of claims 3 to 8, which comprises further step of annealing the substrate B), B2), C) or C2).in the atmosphere that does not contain hydrogen at temperature between approx. 600 and 1050°C, thus producing material with better crystalline quality than before the annealing.

10. A process of preparing a substrate for opto-electric or electrical devices according to any one of claim 9, wherein the step of annealing is carried out in the atmosphere of inert gas with an addition of oxygen between 10 and 30 vol.%.

11. A process of preparing a substrate for opto-electric or electrical devices according to claim 9, wherein the the step of annealing is carried out in a single step or in multiple steps until the desired level of impurities (such as hydrogen and/or ammonia or ions formed from the impurities formed during the crystallization and/or annealing process) is reached.

12. A process of preparing a substrate for opto-electric or electrical devices according to any one of claims 3 to 11, which comprises further step of removing impurities from bulk mono-crystalline nitride by a process of rinsing

in the environment of supercritical ammonia-containing solvent, water or carbon dioxide or being subjected to the action of gaseous hydrogen, nitrogen or ammonia.

13. A process of preparing a substrate for opto-electric or electrical devices according to claim 12, wherein the step of rinsing is carried out with aid of the application of ultrasounds or the exposure to an electron beam.